cally, fitting a parabola by a least squares method based on the data, and performing coefficient comparison.

[0060] FIG. **3** and FIG. **4** are graphs in which actually measured sets of heterodyne spectra are plotted. In regard to the ordinate, the z-coordinate of the upper wall of the internal space is expressed as "1," the z-coordinate of the lower wall of the internal space is expressed as "−1," and the z-coordinate of the middle position between the upper wall and the lower wall of the internal space is expressed as "0." The abscissa represents the frequency of the heterodyne spectra and the central frequency of a heterodyne spectrum measured in the state where an electric field is not applied to the sample cell container C is expressed as 0 [Hz].

[0061] FIG. **3** is a graph for the case where the sample solution is prepared by mixing a polystyrene latex of 262 nm diameter (concentration: 0.001%) in a 10 mM (millimolar) sodium chloride aqueous solution. The measurement conditions are refractive index of solution: 1.3328; viscosity of solution: 0.8878; and dielectric constant of solution: 78.3.

[0062] FIG. **4** is a graph for the case where the sample solution is prepared by mixing a polystyrene latex of 262 nm diameter (concentration: 0.001%) in a 100 mM (millimolar) sodium chloride aqueous solution. The measurement conditions are refractive index of solution: 1.3328; viscosity of solution: 0.8878; and dielectric constant of solution: 78.3.

[0063] In FIG. **3**, the electric field strength is −10.64[V/cm]. In FIG. **4**, the electric field strength is −8.04[V/cm]. In both FIG. **3** and FIG. **4**, the profile of the central frequencies of the heterodyne spectra is substantially a second-order curve (parabola).

[0064] A parabola was fitted to each profile by the least squares method and a comparison was made with the coefficients of formula (2). As a result, in the case of FIG. **3**, the plane at z=0.6017 and the plane at z=−0.6936 were found to be the stationary planes. The migration velocity of the sample particles at the stationary plane was determined and based on the migration velocity, the electrophoretic mobility was determined to be -5.643×10^{-4} [cm^2/Vs] and the ζ potential of the particles was determined to be −72.36 mV.

[0065] In the case of FIG. **4**, the plane at z=0.6078 and the plane at z=−0.6867 were found to be the stationary planes. The migration velocity of the sample particles at the stationary plane was determined and based on the migration velocity, the electrophoretic mobility was determined to be -5.335×10^{-4} [cm^2/Vs] and the ζ potential of the particles was determined to be −68.41 mV.

[0066] The true migration velocity based on the applied electric field of the particles at the stationary plane can thus be determined under the premise of the internal space being a rectangular parallelepiped by measuring the profile of the central frequencies of heterodyne spectra while changing the distance from a wall, fitting a parabola to the profile, and using the formula (2) to specify the stationary plane at which the electroosmotic velocity is zero. Also, the stationary plane can be determined from the electroosmotic flow measurement using the automatic stage moving function of the movable stage **9** to realize accurate measurement of the electrophoretic mobility.

[0067] The structure of the sample cell container C related to the present invention is shown in FIG. **5**A to FIG. **5**C, FIG. **6**, and FIG. **7**. The direction of electric field application is indicated by x and the direction perpendicular thereto is indicated by y. A horizontal plane is defined by x-y. The direction of the laser beam is parallel to the y-direction. The z-direction is a direction perpendicular to x and y. The movable stage **9** is operated so that the sample cell container C moves along the z-direction.

[0068] The sample cell container C is shaped from a transparent resin of rectangular parallelepiped shape. For example, polystyrene may be adopted as the transparent resin. In the interior of the rectangular parallelepiped (referred to as the "sample cell container main body **10**") is formed the sealed space (internal space) **11** that is to be filled with the sample solution. As with the outer shape of the sample cell container main body **10**, the shape of the internal space **11** is also a rectangular parallelepiped. A side surface **12** perpendicular to the y-direction of the sample cell container main body **10** shown in FIG. **5**A and a side surface **13** perpendicular to the y-direction of the internal space **11** are the surfaces at which the laser beam enters and exits and these surfaces are mirror-finished especially carefully. A pair of embedded electrodes **14**, which are for generating an electric field and are embedded in and thereby made integral to the sample cell container main body **10**, are disposed in states of being exposed in the internal space **11** at respective ends in the x-direction of the sample cell container main body **10**. Each embedded electrode **14** is made of gold-plated copper or brass and as is clear from FIG. **5**B, which is a front sectional view, has a U-shaped cross section and is embedded in the sample cell container main body **10**.

[0069] To give an example of dimensions, the size of the internal space **11** as viewed in a y-z cross section is 1×5 mm and the distance between electrodes is 24 mm. The calculated spatial volume is 120 to 130 μliters. A conventional electrophoretic mobility measurement cell is large in cell size (for example, 2×10 mm) and requires a certain sample volume because the sample injection is performed with a syringe, etc. However, for samples mainly in bio-related fields and pharmaceutical-related fields (samples of a high degree of hazard or a microquantity or precious sample), etc., the less the sample amount necessary, the more preferable. Therefore by making small the size of the sample cell container C and the distance between electrodes, it becomes possible to realize a minimum volume for a fully disposable cell.

[0070] An injection port **15** and an extraction port **16** for the sample solution are formed at upper surfaces of the respective ends in the x-direction of the sample cell container main body **10**, a cylindrical tubular injection portion **17** is erected so as to surround the injection port **15**, and a cylindrical tubular extraction portion **18** is erected so as to surround the ejection port **16**. An inner side surface **17***a* of the injection portion **17** and an inner side surface **18***a* of the extraction portion **18** are respectively formed to tubular shapes and are in communication with the internal space **11**. Both the injection portion **17** and the extraction portion **18** are formed of the same transparent resin as the sample cell container main body **10**.

[0071] The inner side surface **17***a* of the injection portion **17** is formed to be inclined so that the cross-sectional area of the tube increases with distance from the sample cell container main body **10**. The inner side surface **18***a* of the extraction portion **18** is also formed to be inclined so that the cross-sectional area of the tube increases with distance from the sample cell container main body **10**.

[0072] A cap **21** that covers and seals the internal space is provided to prevent leakage of the sample solution from the injection portion **17** after the internal space **11** has been filled with the sample solution, and a cap **22** that covers and seals the internal space is provided to prevent leakage of the sample